PEDIATRIC SUPRAVENTRICULAR TACYCARDIA ALGORITHM (SVT)

General Patient Care

Evaluate QRS Duration

NARROW (approx: <0.08 sec)

WIDE (approx: >0.08 sec)

Follow **V-Tach** algorithm

Probable **SVT**
- P-waves absent or abnormal
- Abrupt change to or from normal
- Infants: rate usually >220 bpm
- Children: rate usually >180 bpm

Hemodynamically Stable? *(a)*
- Poor perfusion
- Hypotension
- Respiratory difficulty

YES

Vagal Maneuvers
- Have child blow on thumb
- Dunk child's head in ice water

(do not hold under water for more than 3 seconds)
- Carotid Massage

(Use extreme caution with this maneuver)

- Oxygen 90-100%
- IV/IO KVO

Medical Consultation

Adenosine 0.1-0.2 mg/kg *(b,e)*
- May double dose and repeat once
- Maximum dose: 12 mg

- 12-Lead EKG
- Medical Consultation

NO

- Oxygen 90-100%
- IV/IO KVO

NO

IV/IO Access present or <u>rapidly</u> available?

YES

Adenosine 0.1-0.2 mg/kg *(b)*
- May double dose and repeat once
- Maximum dose: 12 mg

Cardioversion 0.5 J/kg *(c,d)*

Cardioversion 1.0 J/kg *(c,d)*

Cardioversion 1.0 J/kg *(c,d,f)*

- 12-Lead EKG
- Medical Consultation

(a) Hemodynamically unstable: altered mental status with hypo-perfusion evidenced by delayed capillary refill, pallor, peripheral cyanosis, or hypotension. Respiratory compromise may be present. Hypotension being defined as 70 plus twice the child's age in years or less [70 + (2 x years) = systolic BP].
(b) Be prepared for up to 40 seconds of transient asystole.
(c) If calculated joules setting is lower than cardioversion device is able to deliver, use the lowest possible setting .
(d) Evaluate vital signs and consider sedation (diazepam).
(e) RAPID INFUSION (Follow adenosine infusion guidelines).
(f) **INITIATE TRANSPORT**

Pediatric Cardiac Emergencies:
Supra-Ventricular Tachycardia

Note Well: *Cardiac dysrhythmias in otherwise healthy children are frequently the result of respiratory distress.*

I. All Provider Levels

1. Follow the General Patient Care guidelines in section A1.

2. If breathing is adequate, administer oxygen at 90-100% by facemask.

3. If airway cannot be maintained, begin ventilations with B-V-M and initiate advanced airway management using a combi-tube.

Note Well: *Do not use a combi-tube on a patient younger than 16 years of age or less than 5-feet tall.*

Note Well: *The EMT-I and EMT-P should use ET intubation.*

4. Assess vital signs.

5. Determine if the patient is hemodynamically unstable.

Note Well: *Hemodynamic instability is defined as "altered mental status with hypoperfusion evidenced by delayed capillary refill, pallor, peripheral cyanosis, or hypotension." Respiratory compromise may be present. Hypotension is defined as a blood pressure of less than 70 plus twice the child's age in years. [70+(2 x Age)]=systolic BP*

   A. If signs and symptoms of hypotension are present, place the patient in the Trendelenburg position unless pulmonary edema is present.

6. Call for ALS support. Initiate care and do not delay transport waiting for an ALS unit.

Pediatric Cardiac Emergencies: Supra-Ventricular Tachycardia

I. All Providers (continued)

7. Establish an IV of normal saline.

Note Well: *BLS Providers cannot start an IV on a patient less than eight years of age*

Note Well: *An ALS unit must be en route or on scene.*

Note Well: *If IV access cannot be readily established and the child is younger than 6 years of age then ALS Providers only may proceed with IO access. If the child is over 6 years of age, then contact Medical Control for IO access.*

II. Advanced Life Support Providers

1. Initiate cardiac monitoring.

2. Determine the length of the QRS complex.

   A. If the QRS complex is wide (more than 0.08 sec) then treat as ventricular tachycardia (see Pediatric VT with Pulse protocol, Q3).

   B. If the QRS complex is narrow (0.08 sec or less than 0.08 sec) then treat as SVT.

II. Advanced Life Support Providers (continued)

3. If the child is hemodynamically unstable then:

   A. If IV/IO access is readily available, then administer adenosine at 0.1-0.2 mg/kg as an initial dose.
      i. When administering adenosine use a two-syringe technique with a rapid 5-10 cc flush immediately following medication administration.
      ii. Be prepared for up to 40 seconds of transient asystole.
      iii. You may double the dose and repeat once with a maximum single dose of 12 mg with an immediate 5-10 cc flush.

II. Advanced Life Support Providers (continued)

B. If IV/IO access is not readily available, perform synchronized cardioversion at 0.5 J/kg.
   i. If the patient remains in SVT with a pulse, repeat cardioversion at 1 J/kg (maximum 360J).
   ii. Cardioversion may be repeated a third time at 1 J/kg.

Note Well: ***Do Not Delay Cardioversion!*** *Contact medical control to consider sedating the patient before performing cardioversion by administering 0.2 mg/kg of diazepam IV only (maximum single dose 5.0 mg)*

Note Well: *In the event of a provider induced diazepam overdose, administer 0.01 mg/kg of flumazenil IV/IO over 30 seconds. Repeat as needed every minute. Maximum single dose is 0.2mg and maximum total dose is 1mg. (Medical Control Option Only)*

Caution: *Flumazenil may induce seizures, particularly in patients with both tricyclic antidepressant overdose and benzodiazepine overdose.*

C. If the rhythm persists, consult medical control for further direction.

D. Initiate transport and perform a 12-lead EKG. **DO NOT DELAY TRANSPORT!**

II. Advanced Life Support Providers (continued)

4. If the child is hemodynamically stable then:

   A. Perform vagal maneuvers. Vagal maneuvers include one of the following:
      i. Have the child blow on his/her thumb
      ii. Quickly dunk child's face in ice water for no more than 3 seconds and remove.
         a. You may get ice water from a home or use ice packs and hold over the child's head
      iii. Perform carotid massage (please use extreme caution with this procedure and watch for ensuing hypotension)

   B. If the SVT continues, consider termination of efforts and transport.
      i. You may also call Medical Control and ask for permission to deliver adenosine at 0.1-0.2 mg/kg.
      ii. When administering adenosine use a two-syringe technique with a rapid 5-10 cc flush immediately following medication administration.
      iii. Be prepared for up to 40 seconds of transient asystole.
      iv. You may double the dose and repeat once with a maximum single dose of 12 mg.

   C. Follow up with a 12 lead EKG and call medical control for further direction. **DO NOT DELAY TRANSPORT!**

III. Transport Decision

1. Contact medical control for additional instructions.

2. Initiate transport to the nearest appropriate facility as soon as possible.

3. Perform a focused history and detailed physical examination en route to the hospital.

4. Reassess the patient at least every 3-5 minutes or as frequently as necessary and possible.

IV. The Following Options are Available by Medical Control Only

1. Diazepam, 0.2 mg/kg to a maximum single dose of 5.0 mg, IV only for sedation before cardioversion.

2. Flumazenil, 0.01 mg/kg to a maximum single dose of 0.2mg and maximum total dose of 1mg to counteract provider induced diazepam overdose.

3. IO access for patients greater than 6 years of age.

This protocol was developed and revised by Children's National Medical Center, Center for Prehospital Pediatrics, Division of Emergency Medicine and Trauma Services, Washington, D.C.

This Page Intentionally Left Blank